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(54) Protective garments

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(57) Garments are described for use in the occurrence of attack to protect the wearer from contaminants reaching the skin or the lungs, to minimise risk of injury.

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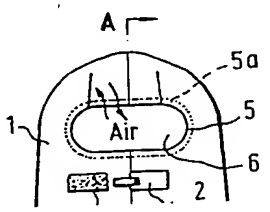

FIG. 1.

ERRATUM

SPECIFICATION No. 2078491A

Page 2, line 14, *after* CLAIMS *insert* (Filed 24 June 1981)

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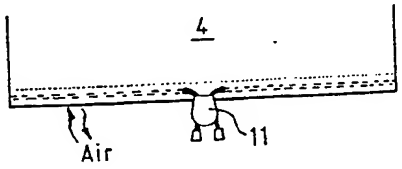
20th May, 1983



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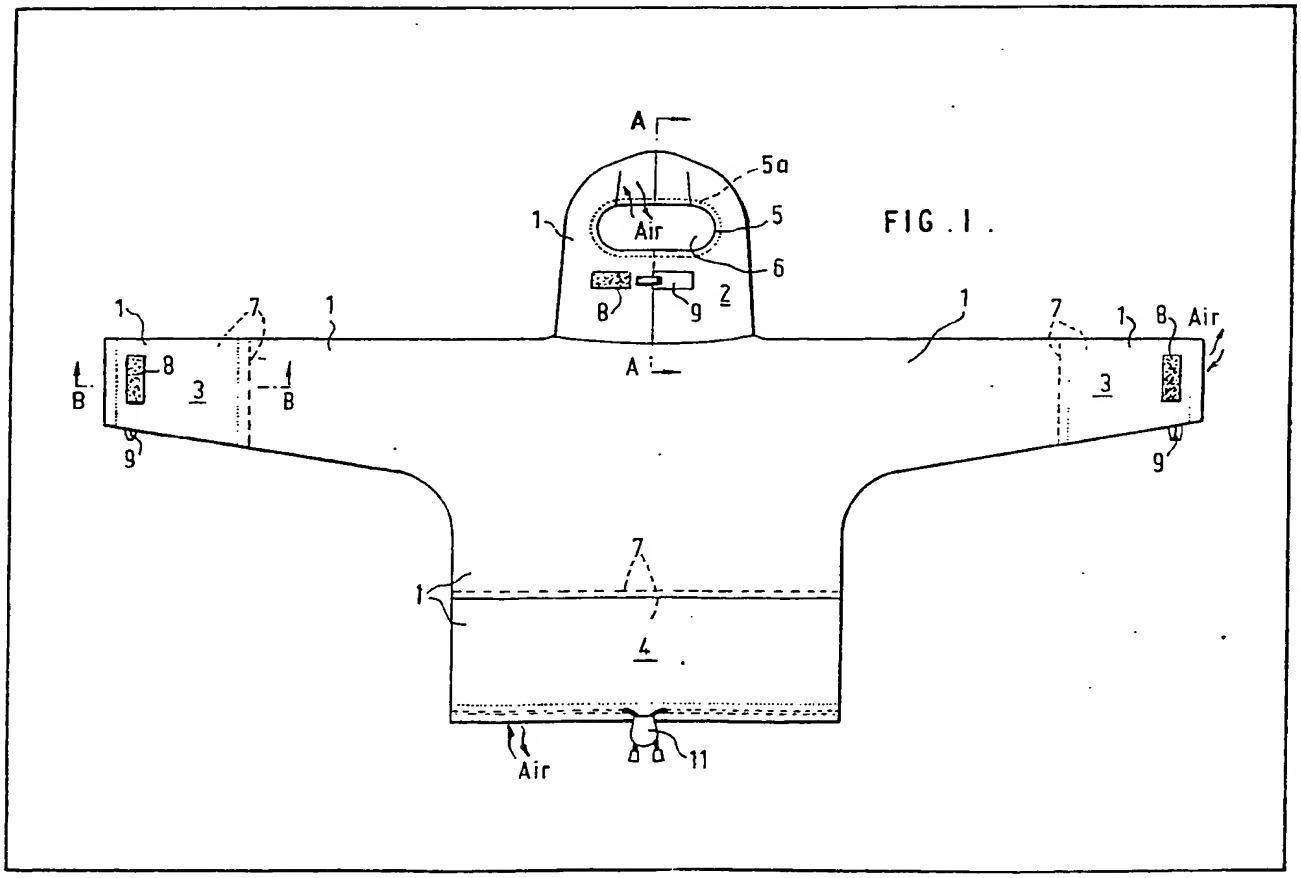

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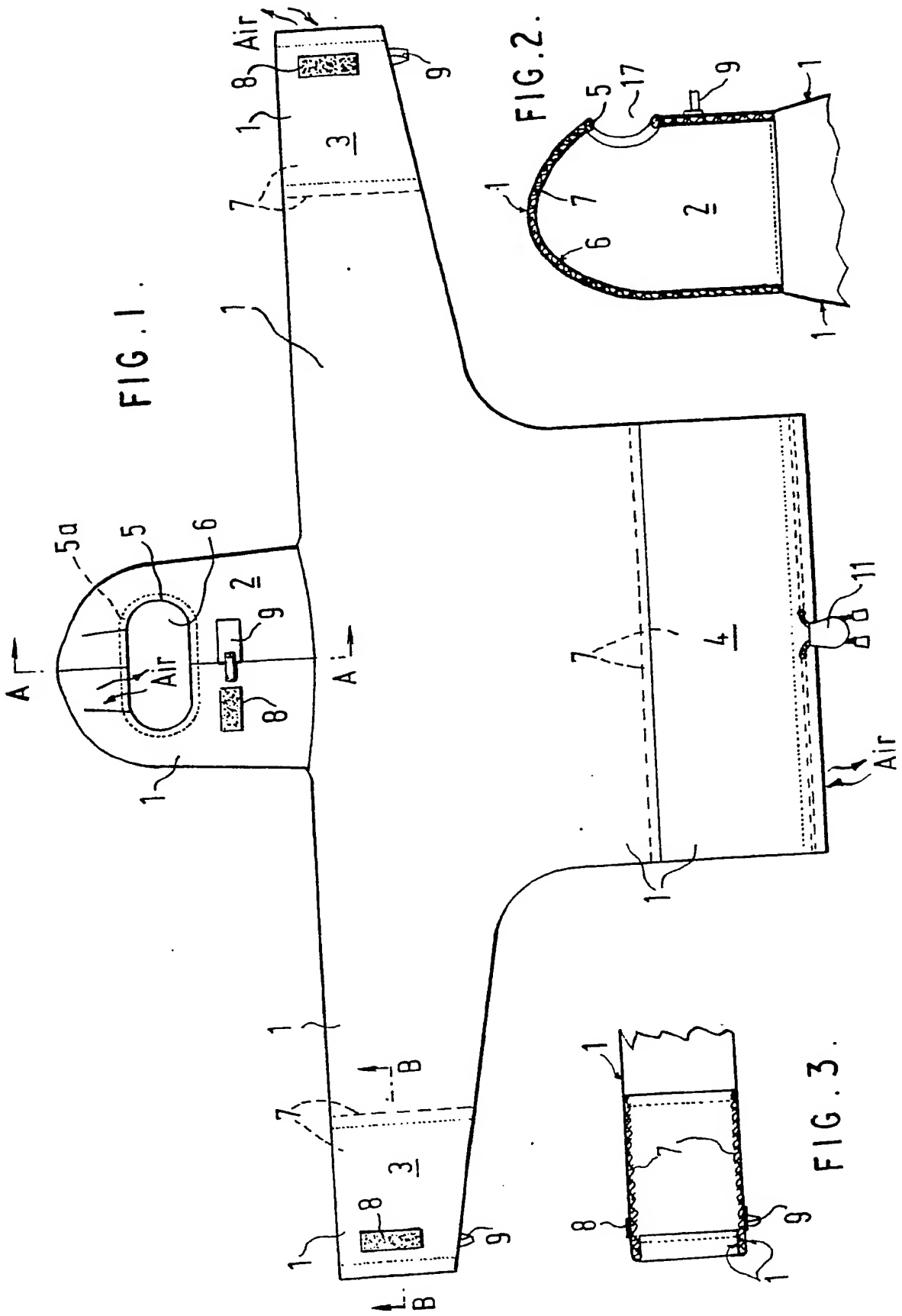

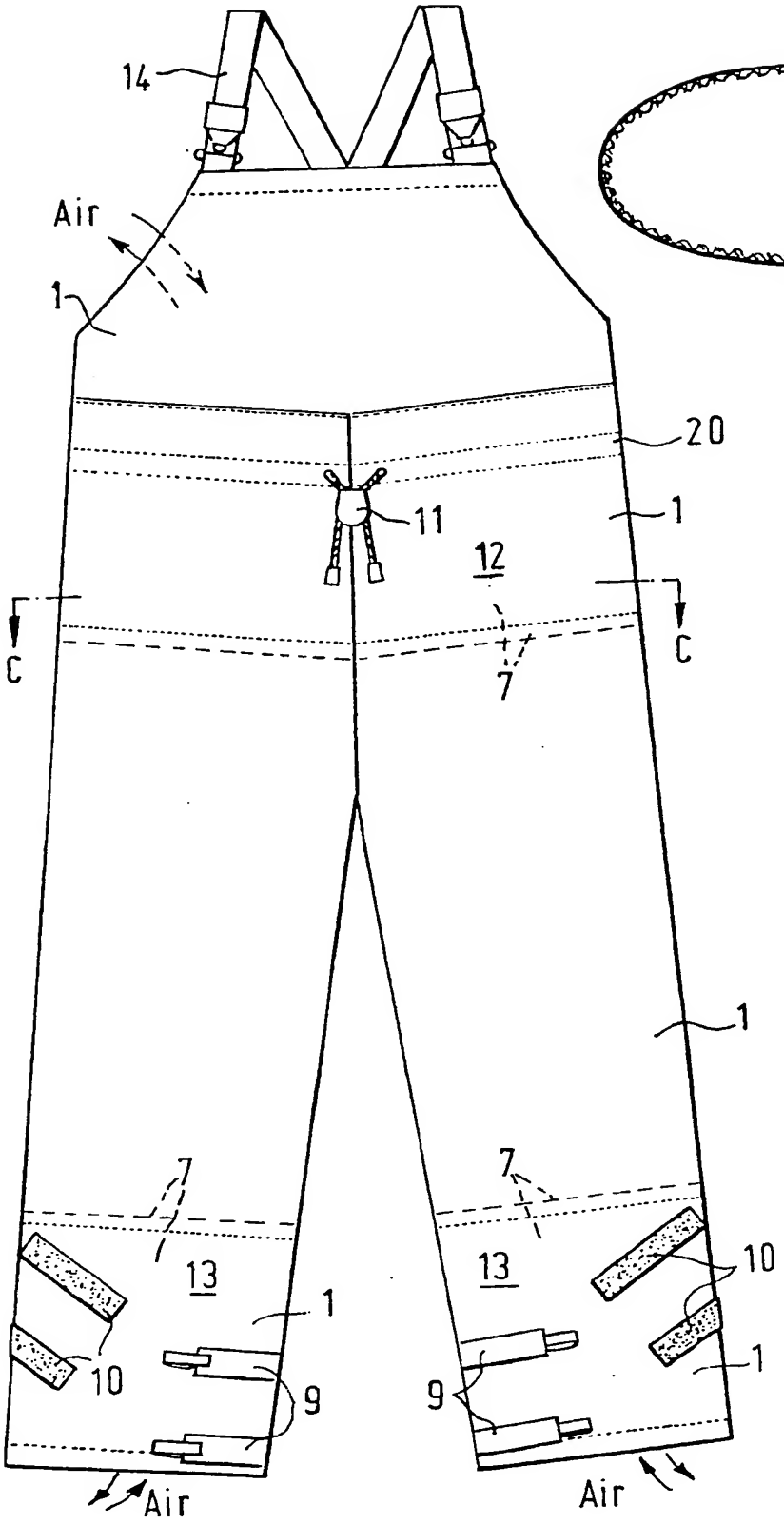

FIG.4.

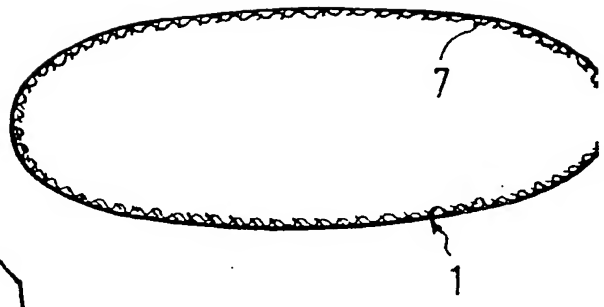

FIG.5.

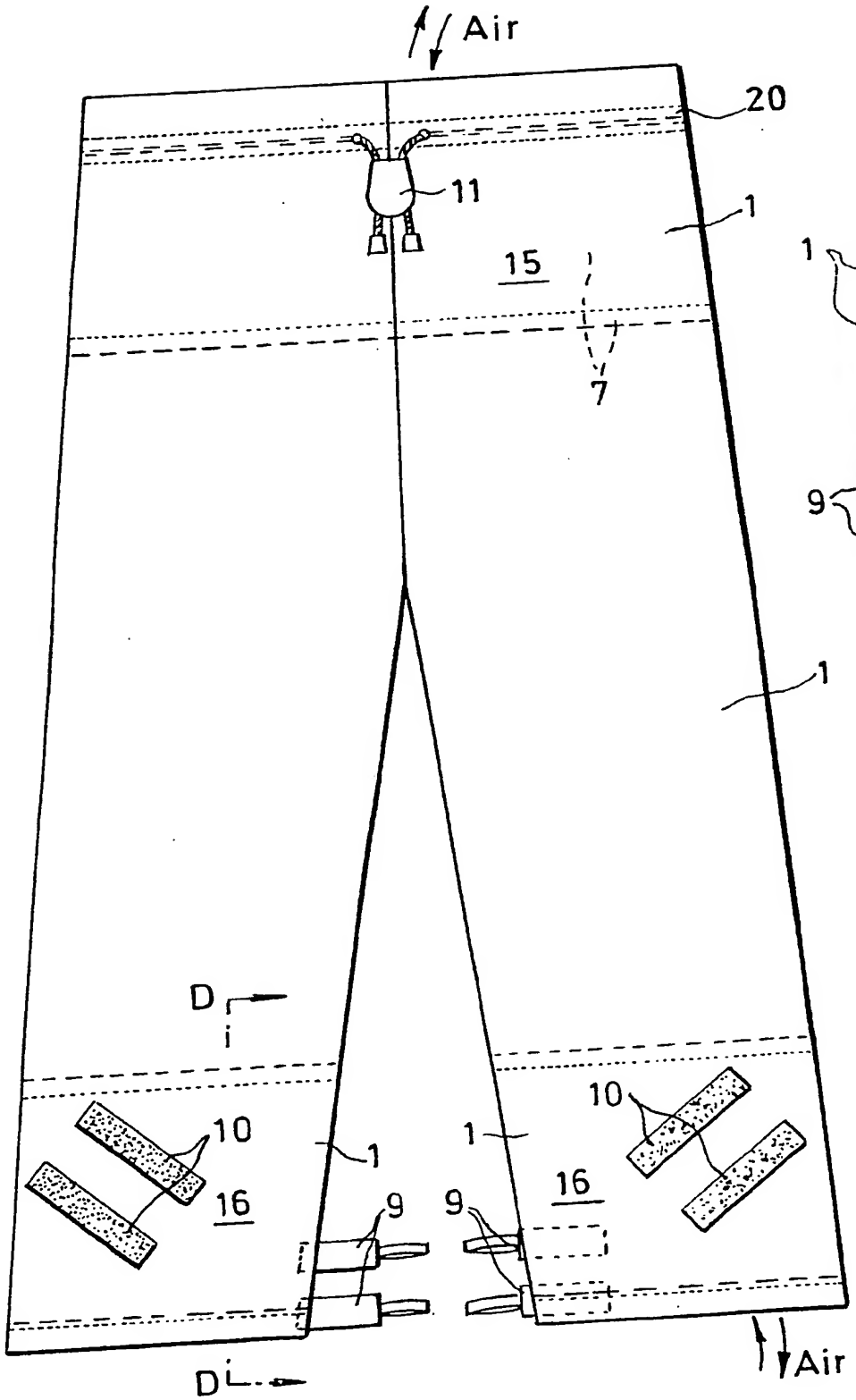

FIG.6.

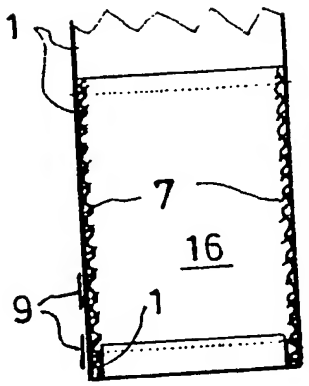

FIG.7.

SPECIFICATION

Protective garments

This invention relates to garments intended to be worn during occurence of nuclear, chemical or biological attack to provide protection from nuclear fall-out and chemical or biological spray – hereinafter singularly or collectively referred to as 'contaminants'.

In the event of such attack there is a possibility that contaminated air can penetrate existing protective clothing.

A problem arises in preventing such contaminants from contacting the skin surface of a person wearing the garment and causing consequent injury or fatality.

It is an object of the present invention to provide protective garments which prevent such contaminants from reaching the skin of a wearer by selective positioning of an air filtering material.

According to this invention there is provided a protective garment constructed of a fabric treated to render such fabric impermeable to air and resistant to contaminants, the garment including internal inserts of an air filtering material at specific regions susceptible to air entry and fastening means to provide a close fit between the garment and a wearer at the locations of said inserts, the arrangement being such that any air drawn into the garment is filtered through said inserts to remove contaminants therefrom.

The garment is preferably an item of clothing in the form of a jacket with integral hood, a pair of trousers, a bib and brace trousers or a boiler suit with integral hood. The entire exterior surface of the garment may be butyl-rubber coated. A preferred fabric of which the garment is made is nylon. The butyl rubber coated nylon garment preferably includes portions of filter material stitched to the outer fabric and located in the interior of the garment.

The invention will now be described by way of example only with reference to the accompanying drawings, illustrating various embodiments and in which:–

Figure 1 is a front view of a jacket with integral hood,

Figure 2 is a section on the line A-A of Figure 1,

Figure 3 is a section on the line B-B of Figure 1,

Figure 4 is a front view of a bib and brace trousers,

Figure 5 is a section on the line C-C of Figure 4,

Figure 6 is a front view of a pair of trousers, and

Figure 7 is a section on the line D-D of Figure 6.

As shown in Figures 1 to 3 of the drawings, a jacket comprises a body portion, arms and an integral hood 2 constructed of a butyl rubber coated nylon fabric 1. The interior of the hood area 2, waist area 4 and cuffs area 3 has inserts of charcoal impregnated foam or cloth 7 securely stitched to the fabric outer material 1, the inserts extending to the respective hems of the garment. The interior of the hood portion 2 has a further layer of cotton 6 adjacent the charcoal impregnated cloth 7 to absorb perspiration from the face and scalp of a wearer. A facial aperture 17 is provided in the hood 2 to allow for insertion of a gas mask. The facial aperture 17 has a perimeter 5 with elasticated inserts 5a to provide a close fit between the garment and the wearer's face or gas mask. Touch and close fastening means 8, 9 (e.g. hook and barb "Velcro") are located on the hood for further tightening. If air is expelled or drawn in then air entry and exit may occur at the facial aperture perimeter which air is subject to filtration through the charcoal impregnated foam or cloth 7.

Sleeve portions 3 are similarly provided with charcoal impregnated cloth inserts but without a cotton liner and include "Velcro" fastening means (8, 9 Figure 3) to provide a close fit between the cuff of the garment and wrist of a wearer. Air intake and exit may occur at this tightened area as the butyl rubber coated nylon fabric 1 is impermeable to air and cannot "breathe".

The waist portion 4 has a comparatively large area of filter material insert extending around the lower body portion to the perimeter hem 20 thereof. A waistband and fastening device 11 are situated at this perimeter to provide a close fit. Again air intake may occur at this boundary portion and accordingly incoming air is filtered through the charcoal foam or cloth insert to remove contaminants.

Referring to Figures 4 and 5, a bib, brace and trouser unit is illustrated with braces 14 attached to a bib, the whole garment being constructed of butyl rubber coated nylon 1. The waist portion 12 and trouser leg hem portions 13 are backed with charcoal impregnated foam or cloth 7 to filter any air indraughted at these locations. A waistband 20 includes a cord and tightening device 11 to permit a close fit between the upper waist portion and the body of a wearer.

Similarly, touch and close fastening means e.g. "Velcro" hook (9, 10) and barb closures are stitched to the lower leg portions 13 to fasten same to the legs of a wearer. The bib and brace trousers are designed for use in instances of considerable activity – e.g. rescue working or fire fighting, providing a more secure fit than ordinary trousers.

As shown in Figures 6 and 7 a pair of protective trousers is constructed of butyl-rubber coated nylon 1 which material extends over the entire surface area as in previously described garments. A waist region 15 has an internal insert of charcoal impregnated foam or cloth securely stitched to the outer fabric 1 to lie adjacent the wearer. A waistband 20 is included at the upper hem with an inserted cord and fastening device 11 to pull the trousers into a tight fit.

Trouser leg hem portions 16 are backed by charcoal impregnated cloth or foam filter material 7 which is securely stitched to the outer nylon fabric. These leg portions 16 also have external hook and barb (9, 10) fastening means to provide a close fit with the wearer.

The outer fabric of nylon base with butyl rubber

coating seals and renders each garment proof against nuclear fall-out and chemical or biological spray or mist contaminants.

In use, the coated nylon fabric does not 'breathe' but body movement causes air to be forced out at the regions of charcoal cloth inserts which are fastened or tightened on the body of a wearer. Such air is replaced by air indraughted from the atmosphere at the same locations in a 'bellows' type of action. Strategic positioning of carbon cloth inserts ensures that contaminated air is filtered before reaching the wearer. Such filter inserts are located at each position where contaminated air could enter.

CLAIMS

1. A protective garment constructed of a fabric treated to render such fabric impermeable to air and resistant to contaminants, the garment including internal inserts of an air filtering material at specific regions susceptible to air entry and fastening means to provide a close fit betweeen the garment and a wearer at the locations of said inserts, the arrangement being such that any air drawn into the garment is filtered through said inserts to remove contaminants therefrom.

2. A garment according to Claim 1 constructed of nylon in the form of an item of clothing.

3. A garment according to either preceding Claim wherein the exterior surface is coated with butyl rubber.

4. A garment according to any preceding Claim wherein the internal inserts are stitched to the outer fabric and located in the interior of the garment.

5. A garment according to any preceding Claim wherein the internal inserts are made of charcoal impregnated foam or cloth.

6. A garment according to any preceding Claim wherein the fastening means are selected from elasticated inserts, hooks and barbs and a cord and tightening device.

7. A garment according to any preceding Claim in the form of a jacket with integral hood.

8. A garment according to Claim 7 wherein the interior of the hood, waist and cuffs area is provided with inserts of filter material secured to the fabric and extending to the respective hems of said areas.

9. A garment according to Claim 7 or 8 wherein the interior of the hood includes a layer of perspiration absorbing material adjacent the filter insert.

10. A garment according to any of Claims 7 to 9 wherein the hood includes a facial aperture with a perimeter having fastening means to provide a close fit between the garment and wearer's face or a gas mask projecting from said aperture.

11. A garment according to any of Claims 8 to 10 wherein the jacket includes fastening means to provide a close fit at the hood, waist and cuffs area.

12. A garment according to any of Claims 1 to 6 in the form of trousers or a combined trousers, bib and brace unit wherein inserts of filter material are positioned at the waist and lower trouser portions and extend to the respective hems thereof.

13. A garment according to Claim 12 wherein the waist and lower trouser portions are provided with fastening means to ensure filtration of incoming air.

14. A protective garment substantially as herein described with reference to and as illustrated in any of the accompanying drawings.

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